CDAT Newsletter, May 2006, News

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News – OPeNDAP server

New CDAT v4.1 enables OPeNDAP interface to the IPCC ESG climate model simulations data holdings. The OPeNDAP server enables to authenticate the user access, list files and subdirectories, display metadata information, allow user to browse and download the chosen data directly into the VCDAT for analysis.

OPeNDAP is a software framework that allows access to remote scientific datasets. The core of OPeNDAP is a specification of an http−based protocol that describes how clients and servers should communicate data over the network. There are a variety of clients and servers available that understand DAP; an adaptation of the PyDAP server is being used for the IPCC AR4 model output database.

The server provides access to IPCC datasets. A *dataset* is an aggregation of a set of related data files into a single virtual file. In general, a dataset consists of all data variables for a given combination of model, scenario, experimental run, temporal frequency, and submodel (ocean or atmosphere). A dataset is represented by a CDMS XML file.

Be aware that there is a definite overhead to accessing data through the OPeNDAP server. Network speed, HTTP protocol, and server delays combine to limit access speed in comparison to direct disk reads.

You can access the IPCC AR4 data in a variety of ways:

- from VCDAT

News – CDAT Demo

New release of **CDAT v4.1** comes with brand new **CDAT Demo GUI.** The CDAT Demo will not only enable one to quickly view what capabilities exist within CDAT, but will also serve as a learning tool. Each demo is accompanied by the source code and can be run in debugger mode by stepping through the code and observing the results from a particular command.

To start CDAT Demo just type:

'cdatdemo'

at a shell prompt, you will see the splash screen and then the Main Menu Window will appear. Here is the screenshot of the Main Menu window (click on the image to see bigger image)

Click on a button to get to the specific demo group. A new window will appear with the list of avaliable tutorials, for example by

- from CDMS
- through the web browser

To access the IPCC data from VCDAT click on the 'Portal Internet Manager' Button as shown in the image below (click on the image to see the bigger picture)

This will open a new window with the data holdings directory. For your convenience the IPCC AR4 data portal catalog has been selected. In the future, more portal catalogs will be added.

Click on the 'PyDAP server' tab (+) to open it

When you further click on the choosen model run, first you will be presented with the password authentication window, and after entering the username and password to the IPCC AR4 data holdings, you will see the metadata for the choosen dataset appear in the right window.

Click on the 'Open File' or 'Open File and Exit' buttons at the bottom of the window to import the data into the VCDAT. From there on, you can select the variable in the VCDAT in the usual way and plot it.

You can access the IPCC data from CDMS module, provided that CDAT has been compiled with the opendap client libraries. The form of the open call is:

```
f=cdms.open('http://
   username:password@climate.llnl.gov/dap/ipcc4/
   <scenario>/<model>/<dataset>.xml')
```

For example:

```
f=cdms.open('http://username:password@climate.llnl.gov/
   dap/ipcc4/20c3m/ncar_ccsm3_0/
   pcmdi.ipcc4.ncar_ccsm3_0.20c3m.run6.atm.mo.xml')
```

Once opened, an OPeNDAP dataset can be accessed in the normal CDMS fashion. However, since some of the datasets are very large – 100s of GB – there is a limit on the amount of data that can be accessed through a single operation. The limit is currently set to 64MB, but may change in the future. There is no limit on the number of data accesses that can be made in a single session.

clicking on 'Earth Sciences' you will see:

Click on the "View Source" button at the bottom of the window to see the color highlighted source code

Or from the previous 'CDAT Earth Sciences' window click on the 'Run in Debugger' button to run the demo by stepping through the commands. Here is how the PyDebug screen looks like:

To make the source code appear in the upper debugger window, click 'Step' button. A red square and the arrow show where the current code execution is. Press 'Next' to execute current command and go to the next line of code, or press 'Continue' to execute the whole script. You can also experiment with 'Step' button to go inside a particular module or method.
We hope you will find the CDAT Demo very informative and useful.

To access the IPCC AR4 data from the web browser see the PyDAP server description on the PCMDI software webpage